

## REMARKS

Claims 1-21 remain pending in this application. Claims 1, 2, 12-13, and 20 have been amended. No new matter has been introduced by way of the present amendment. Reconsideration of the application is respectfully requested.

In the Final Office Action, claims 1, 2, 12-13 and 20 stand rejected as allegedly being unpatentable over U.S. Patent No. 4,505,150 to Seymour, et al. (*Seymour*) in view of U.S. Patent No. 4,920,489 to Hubelbank, et. al. (*Hubelbank*). Applicants respectfully disagree and request that the Examiner's § 103 rejections of claims 1, 2, 12, 13 and 20 be withdrawn.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure. M.P.E.P. § 2142. Moreover, all the claim limitations must be taught or suggested by the prior art. If an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending therefrom is nonobvious.

With respect to alleged obviousness, there must be something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination. In fact, the absence of a suggestion to combine is dispositive in an obviousness determination. The mere fact that the prior art can be combined or modified does not make the resultant combination obvious unless the prior art also suggests the desirability of the combination. The consistent

criterion for determining obviousness is whether the prior art would have suggested to one of ordinary skill in the art that the process should be carried out and would have a reasonable likelihood of success, viewed in the light of the prior art. Both the suggestion and the expectation of success must be founded in the prior art, not in the Applicant's disclosure. M.P.E.P. § 2142.

Federal Circuit precedent makes it clear that, in an obviousness situation, the prior art must disclose each and every element of the claimed invention, and that any motivation to combine or modify the prior art must be based upon a suggestion in the prior art. Conclusory statements regarding common knowledge and common sense are insufficient to support a finding of obviousness. Thus, to establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim features. Additionally, the references must provide a motivation to combine in the manner suggested by the Examiner. Mere conclusory statements to combine are insufficient.

In independent claim 1, Applicants describe and claim, among other things, a temperature sensor being in thermal communication with at least a portion of a semiconductor memory unit and controlling refresh operations in the semiconductor memory unit over the preselected temperature range. By being in the thermal communication, a semiconductor temperature sensor ensures desired operation of a semiconductor device, such as a memory unit over a preselected temperature range.

For at least the aforementioned reasons, Applicants respectfully submit that the pending claims are not rendered obvious to one of an ordinary skill in the art in view of the cited references, either alone or in combination. To establish a *prima facie* case of obviousness, the

prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974).

*Seymour* is directed towards sensing of surges in gas turbine engines. In a gas turbine engine when a surge (a breakdown of airflow through the engine compressor) occurs, too little air enters the engine combustors sufficiently to weaken the burning fuel mixture and unless the fuel supply is reduced an explosion may occur. *Seymour* describes a pyrometer that senses blade temperature in the engine and detects the onset of such an engine surge. In particular, a pyrometer 2 produces an electrical output signal representative of the temperature of the high-pressure turbine of a gas turbine engine. See *Seymour*, at column 1, lines 58-61. A circuit senses a surge in a gas turbine engine, from a pyrometer output signal representative of the temperature of a turbine of the gas turbine engine. See *Seymour*, at column 1, lines 34-37. In this way, *Seymour* distinguishes between spikes in a pyrometer output signal due to hot, uncombusted particles and increases in the output signal indicative of a surge.

As discussed, the *Seymour* reference does not describe or suggest a temperature sensor being in thermal communication with at least a portion of a semiconductor memory unit and controlling refresh operations in the semiconductor memory unit over the preselected temperature range. Further, the *Hubelbank* reference does not remedy the aforementioned fundamental deficiency with the primary reference. The cited references also fail to provide any suggestion or motivation for modifying the prior art to arrive at Applicant's claimed invention. More specifically, the prior art reference does not teach or suggest all the claimed features. Even if modified, the cited references, absent a specific suggestion or motivation, fail to render the rejected claims obvious. Therefore, Applicants submit that all pending claims are patentably distinguishable over the cited references.

Moreover, **Hubelbank** teaches away from the present invention. In particular, **Hubelbank** teaches controlling refresh rate of the DRAMs according to the ambient temperature, whereas the present invention teaches use of thermal communication and refreshing control over a desired temperature range. It is by now well established that teaching away by the prior art constitutes *prima facie* evidence that the claimed invention is not obvious. *See, inter alia, In re Fine*, 5 U.S.P.Q.2d (BNA) 1596, 1599 (Fed. Cir. 1988); *In re Nielson*, 2 U.S.P.Q.2d (BNA) 1525, 1528 (Fed. Cir. 1987); *In re Hedges*, 228 U.S.P.Q. (BNA) 685, 687 (Fed. Cir. 1986).

For at least the aforementioned reasons, Applicants respectfully submit that the present invention is not obvious over **Seymour** and **Hubelbank** references, either alone or in combination. Applicants respectfully request that the Examiner's rejections of claims 1, 2, 12, 13 and 20 under 35 U.S.C. 103(a) be withdrawn. Likewise, claims 3 and 14 are allowable over **Seymour**, **Hubelbank** and Kleijne, et al. (U.S. Patent No. 4,811,288, hereinafter "**Kleijne**") references for at least the same reasons as set forth above in the context of claim 1. Furthermore, Applicants respectfully submit that claims 5, 6, 16, and 17 rejected in view of **Seymour** and **Hubelbank** and U.S. Patent 5,940,256 to MacKenzie, et al. (**MacKenzie**) references, are also in condition for allowance based on at least similar grounds.

As set forth below, the Examiner relies on various references to reject some of the independent and dependent claims. Claims 4 and 15 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over **Seymour** in view of **Hubelbank** and further in view of the U.S. Patent No. 6,489,831 to Matranga et al. (**Matranga**). For reasons indicated above, claims 4 and 15 are in condition for allowance.

With regard to claims 7 and 18 that stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over **Seymour**, **Hubelbank** and further in view of U.S. Patent No. 5,796,290

to *Takahashi*, the Applicants submit that *Takahashi* fails to remedy deficiencies in both the cited primary references. Likewise, with regard to claims 8, 9, 11 and 19 that stand rejected over *Seymour*, *Hubelbank* and further in view of U.S. Patent No. 6,087,821 to *Kojima* in further view of U. S. Patent Application Publication No. 2003/0042014 to *Jin*, withdrawal of § 103 rejections is respectfully requested as the *Kojima* and *Jin* references fail to cure deficiencies in the two primary references. As to claim 10 that stands rejected under 35 U.S.C. § 103(a) over *Seymour*, *Hubelbank*, *Kojima* and *Jin* and further in view of U.S. Patent No. 6,825,736 to Kehler et al. (Kehler), the Examiner is requested to consider allowance for at least the aforementioned reasons alone. Finally, with respect to § 103 rejections of claim 21 over *Seymour*, *Hubelbank* and further in view of the U.S. Patent 6,564,288 to *Olariq*, et al. (*Olariq*), the Applicants respectfully request reconsideration of the rejection as it is in condition for allowance for the reasons set forth above.

The Examiner admits that *Seymour* fails to teach or suggest such a temperature sensor being in thermal communication with a semiconductor memory and for controlling refreshing in a semiconductor memory unit over a preselected temperature range for a preselected duration of time, as set forth in claim 1. That is, *Seymour* is completely silent regarding this feature now set forth in independent claims 1, 12, and 20. To provide a teaching for the features absent from the *Seymour* reference, the Examiner relies upon the *Hubelbank* reference. *Hubelbank* does not describe a temperature sensor in thermal communication with at least a portion of a semiconductor memory unit, let alone to control refreshing in the semiconductor memory unit over the preselected temperature range. Thus, *Hubelbank* fails to disclose or suggest all the features of claim 1. However, the Examiner asserts that *Hubelbank* teaches the claimed invention in Figure 1 and the associated description. Applicants respectfully disagree.

**Hubelbank** describes storage devices for episodic signals, such as electrocardiogram (ECG) signals. In particular, a technique to store ECG signals on portable storage media is described by **Hubelbank** for monitoring ambulatory patients. See column 1, lines 5-12. In other words, **Hubelbank** performs direct digital storage of ECG signals by storing these signals in a way that desired characteristics of a CDG signal may be reproduced with ease. See **Hubelbank**, column 2, lines 8-15.

**Hubelbank** further teaches that instead of a temp sensor, it is the processor 26 that controls the refreshing of the DRAMs. The refresh rate is not controlled over a preselected temp range, but rather the refresh rate is controlled according to the ambient temperature. As such, **Hubelbank** fails to show use of the thermistor 40 and resistor 42 are disposed to form a voltage divider in Figure 1 or any other Figures. See **Hubelbank**, at column 5, lines 27-30. Based on the above indicated legal standard, it is respectfully submitted that **Hubelbank** fails to anticipate independent claim 1. Thus, claim 1 and claims dependent therefrom are in condition for allowance which is respectfully requested of the Examiner.

The Examiner alleges that **Hubelbank** in Figure 1 discloses the temperature sensor set forth in claim 1. More specifically, the Examiner asserts that since a thermistor 30 and resistor 42 are adapted to form a voltage divider as described at column 5, lines 27-29, a refresh rate is controlled over a preselected temperature range, as set forth in claim 1. In contrast, **Hubelbank** describes adjusting the refresh rate according to the ambient temperature. See **Hubelbank**, col. 5, lines 34-35. The Examiner further asserts that because **Hubelbank** describes controlling refreshing of the DRAMS by periodically refreshing the DRAM devices, it teaches or suggests controlling the refreshing in a semiconductor memory unit over a preselected temperature range. However, **Hubelbank** fails to describe or suggest control of refreshing over a desired range of

temperature, as set forth in claim 1. As such, **Hubelbank** also fails to clarify forming of the voltage divider in Figure 1 based on the thermistor 40 and the resistor 42.

In claim 1 the temperature sensor is in thermal communication with a semiconductor memory device and controls its refreshing. In other words, claim 1 states that at least a portion of a temperature sensor is located, for example, within or adjacent the semiconductor memory device such that it provides an adequate indication of temperature of the memory device, such as a memory array to reactively adjust or modify refreshing. That is, instead of implementing a worst-case refresh cycle that ensures proper operation of the memory device 110 at extreme temperatures, a reactive adjustment of the frequency of the refresh cycle may be implemented. Indeed, the Applicants' Specification describes that, during normal temperature ranges, a more efficient refresh cycle may be implemented, and during extreme conditions, such as high temperature ranges, appropriate refresh cycles may be implemented, thereby promoting many advantages, such as power savings. See Applicants' Specification, on page 8, line 23 to page 9, line 4.

Accordingly, Applicants respectfully submit that **Seymour** and **Hubelbank** do not disclose, teach, or suggest all of the elements of independent claims 1, 12, and 20 whether considered alone or in combination. Thus, Applicants respectfully assert that independent claims 1, 12, and 20 and respective dependent claims are in condition for allowance, which is respectfully requested of the Examiner.

Moreover, absent improper hindsight, the Examiner has not met the burden of indicating the motivation to combine the cited references therein. Therefore, Applicants respectfully submit that the Examiner reconsider the section 103 rejections of claims 1, 12 and 20 and the claims dependent therefrom.

In the Office Action, dependent claims 3 and 14 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Seymour* in view of *Hubelbank* and further in view of the U.S. Patent No. 4,811,288 to Kleijne et al. (*Kleijne*). Applicants respectfully traverse the Office's §103 rejection of dependent claims 3 and 14. Claim 3 is directed to a temperature sensor that, among other things, includes a comparator adapted to deliver a second signal in response to a parameter of a first signal falling below a parameter of a reference signal, and to discontinue delivery of the second signal in response to the parameter of the first signal rising above the parameter of the reference signal by a preselected magnitude.

As the Examiner well knows, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.

With respect to alleged obviousness, there must be something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination. In face, the absence of a suggestion to combine is dispositive in an obviousness determination. The mere fact that the prior art can be combined or modified does not make the resultant combination obvious unless the prior art also suggests the desirability of the combination. See M.P.E.P. §2143.01. The consistent criterion for determining obviousness is whether the prior art would have suggested to one of ordinary skill in the art that the process should be carried out and would



have a reasonable likelihood of success, viewed in the light of the prior art. Both the suggestion and the expectation of success must be founded in the prior art, not in the Applicant's disclosure.

Applicants submit that claim 3 is not obvious in view of *Seymour*, *Hubelbank* and *Kleijne*, either considered alone or in combination. As discussed below, the Examiner concedes that *Seymour* fails to teach or suggest the feature in claim 3 as to the comparator. The Examiner relies on *Hubelbank* and *Kleijne* to teach this feature. However, *Hubelbank* and *Kleijne* also fail to teach or suggest this feature including the comparator. *Kleijne* is directed to a security device, such as a housing constructed to prevent external access to sensitive data stored therein. The Examiner asserts that *Kleijne* describes the comparator of claim 3 since *Kleijne* teaches a low temperature sensor 132 in the tamper detection circuitry 102 to protect the security device 10 against tampering at extremely low temperatures and a low voltage detector 130 that may be a voltage comparator which develops a low output when the voltage across resistor 152 falls below an internal reference potential of +1.15 volts. See *Kleijne*, at column 8, line 64 through column 9, line 8, and column 10, lines 19-23 and 29-45.

Applicants respectfully disagree with this reasoning since this assertion is not supported at all by the language in *Kleijne*. There are several problems with the Examiner's position. As an initial matter, it is well-established that the prior art references when considered alone or in combination, must teach each and every claimed feature exactly. One problem with the Examiner's rejection is that it is not supported by the very reference upon which the rejection relies. The low voltage detector 130 that may be a voltage comparator does not discontinue the low output in response to the voltage across resistor 152 rising above any internal reference potential by a preselected magnitude. At most, the voltage comparator can provide an output

indicative of a unidirectional swing relative to the internal reference potential. Contrary to *Kleijne*, claim 3 recites a comparator adapted to deliver a second signal in response to a parameter of a first signal falling below a parameter of a reference signal and to discontinue delivery of the second signal in response to the parameter of the first signal rising above the parameter of the reference signal by a preselected magnitude. Thus, neither *Seymour* nor *Kleijne* teach or suggest such a comparator. Furthermore, *Seymour*, *Hubelbank* and/or *Kleijne* fail to provide any suggestion to modify or combine the prior art as suggested by the Examiner so as to arrive at Applicants' claimed invention.

Further, those skilled in the art would not combine *Seymour*, *Hubelbank* and *Kleijne* to make obvious all of the elements of claim 3 of the present invention. *Seymour* is directed to sensing temperature of a physically moving mechanical part in an engine for the purposes of detecting a variation in an air flow to avoid explosion. *Hubelbank* does not cure the deficiencies in *Seymour*, as set forth above in the context of claim 1. In contrast, *Kleijne* is directed to a data security device for protecting stored sensitive data therein from external access. The Examiner uses improper hindsight reasoning to selectively cite portions of the disclosures of *Seymour* and *Kleijne* to render obvious all of the elements of claim 3. There is no indication of motivation in the cited prior art to prompt those skilled in the art to combine their teaching to render obvious all of the elements of claim 3. Without applying improper hindsight reasoning, those skilled in the art would not combine *Seymour*, *Hubelbank* and *Kleijne* to obviate all of the elements of claim 3 of the present invention. However, as described above, even if *Seymour*, *Hubelbank* and *Kleijne* were combined, all of the elements of claim 3 would not be obtained. Moreover, all the claim limitations must be taught or suggested by the prior art. If an independent claim is nonobvious under 35 U.S.C. §103, then any claim depending therefrom is nonobvious.

Therefore, the Examiner fails to establish a *prima facie* case of obviousness in light of the amendments and arguments provided herein. Therefore, Applicants respectfully assert that claims 3 and 14 are allowable.

Applicants respectfully submit that the rejected claims are not rendered obvious in view of the applied references. That is, *the cited references* fail to address the above-addressed shortcomings of *Seymour*. In addition, motivation to combine the cited references to render the pending claims obvious in a *prima facie* manner is not established by the Examiner. Accordingly, the pending claims are not rendered obvious in a *prima facie* manner, as suggested by the Examiner.

Arguments with respect to dependent claims have been noted. However, in view of the aforementioned arguments, these arguments are moot and therefore not specifically addressed. To the extent that characterizations of the prior art references or Applicants' claimed subject matter are not specifically addressed, it is to be understood that Applicants do not acquiesce to such characterization. Reconsideration of the present application is respectfully requested.

For at least the aforementioned reasons, Applicants respectfully submit that the Examiner failed to make a *prima facie* case that the present invention is obvious over the prior art of record and request that the Examiner's rejections of claims 4-11, 15-19 and 21 under 35 U.S.C. §103(a) be withdrawn.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Houston, Texas telephone number (713) 934-4089 to discuss the steps necessary for placing the application in condition for allowance.

Respectfully submitted,

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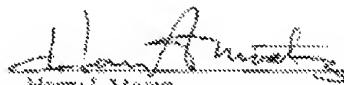
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